



Forest Insect & Disease Management

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AN EVALUATION OF IPS STATUS ON THE OKEFENOKEE NATIONAL WILDLIFE REFUGE

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ABSTRACT

On February 15, 1979 a fire burned approximately 100 acres of slash and longleaf pine on the Okefenokee National Wildlife Refuge. Inspection of the stand by Refuge personnel revealed the presence of Ips in the young understory saplings in the burned old growth stand and an adjacent 14 acre thirteen year old plantation. An evaluation of the problem by the Forest Insect and Disease Management personnel confirmed the presence of the three Ips species common to the south. All merchantable trees have been salvaged from the destroyed plantation. It is recommended that: (1) the remaining portion of the plantation be piled and burned to kill the developing brood to prevent their emergence and attack of the adjacent fire damaged stand, (2) damaged understory saplings in the mature stand be removed and destroyed, and (3) the removal of suppressed and stressed poles and sawtimber in the burned area be delayed for several months. These actions may prevent additional damage in the residual stand.

INTRODUCTION

The Okefenokee National Wildlife Refuge contains 396,000 acres of which approximately 12,000 is managed forested land located predominately around the swamps edge.

On February 15th a fire in compartment 8 destroyed a fourteen acre slash pine plantation and damaged the old growth slash and longleaf on Blocks 28, 29 and 30 (Figure 1). Forest Insect and Disease Management personnel were requested to evaluate a potential Ips problem detected by Refuge personnel. On March 28th, Harold Flake, Field Representative and John Ghent, entomologist examined the burned area to assess the problem.

The area burned provides a buffer between the swamps edge and Highway 177. Slash pine is the predominate species, but when present longleaf is favored due to its limited numbers and denning characteristics for certain wood-pecker species.

A management objective for the burned area is to maintain species diversity and age class composition for wildlife habitat and aesthetic attributes. Should the old growth slash and longleaf pine, that have been fire stressed, be attacked and killed by developing Ips populations in the area this management objective would be adversely affected.

In addition to the fire caused damage the trees are drought stressed. Rainfall the last half of 1978 and the first quarter of 1979 are well below normal limits. This drought condition in itself is favorable for the build-up of damaging Ips populations. When combined with other adverse conditions such as fire, the likelihood of an Ips outbreak is even higher. Immediate action is needed to eliminate the current Ips infestation and reduce the possibility of an Ips outbreak in the stressed slash and longleaf stands.

IPS BIOLOGY

Ips calligraphus (Germ), I. grandicollis (Eichh.), and I. avulsus (Eichh.) are native forest pests that will attack all species of pines in the south. Recently killed trees or those under severe stress are preferred hosts although apparently healthy trees can also be attacked.

The portion of the tree attacked is characteristic for each Ips species. I. calligraphus, the largest of the three species, typically colonize the stump, trunk, and large limbs of recently felled trees. During periods of drought this is one of the first species of Ips to attack stressed trees.

COMPARTMENT 8
MIDDLE SECTION

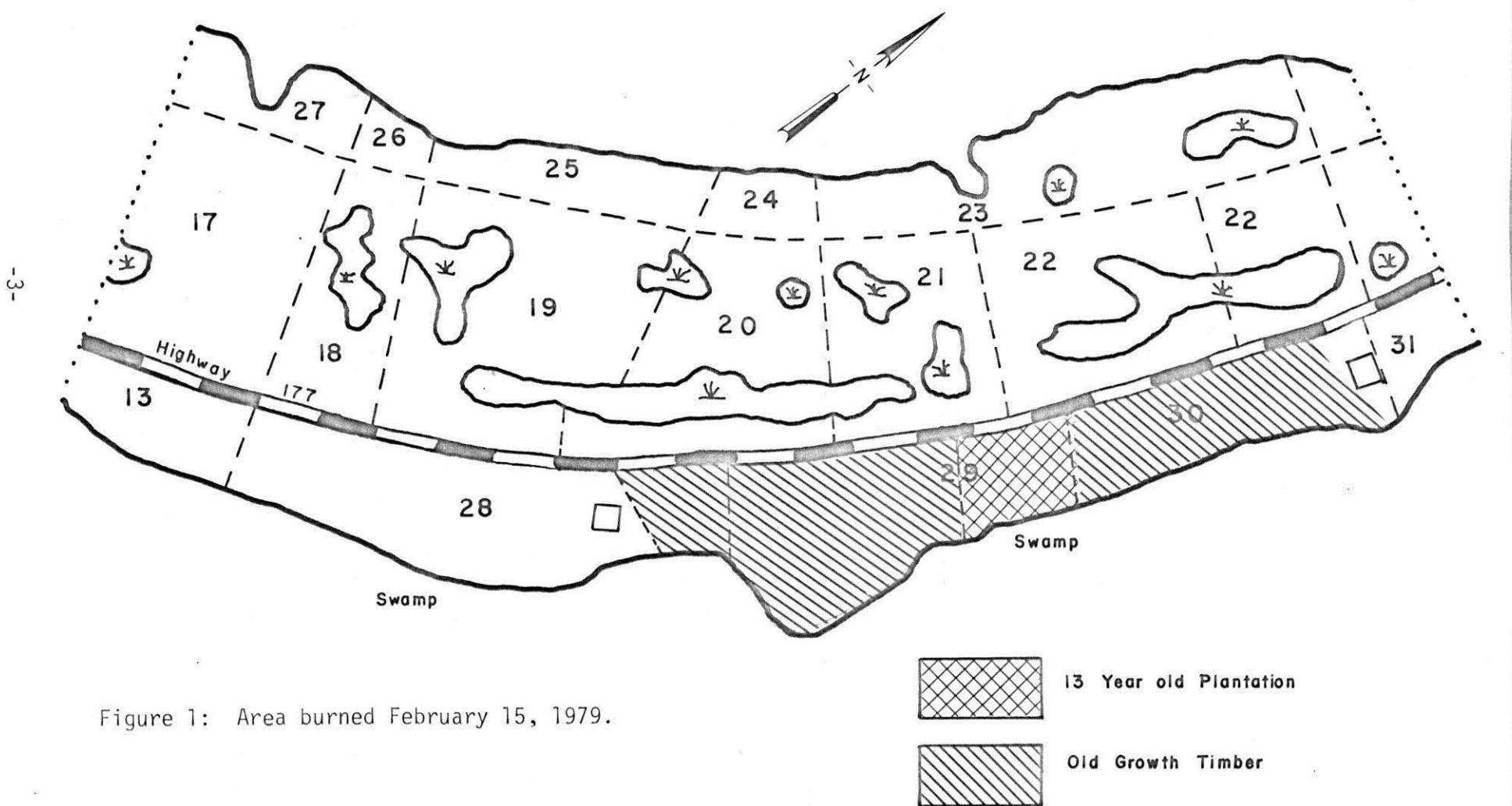


Figure 1: Area burned February 15, 1979.

I. grandicollis, the middle sized species, prefers limbs and the upper portion of the trunk. During periods of environmental stress this group may increase in number causing spot or group kills. Populations normally develop in areas of recent logging operations where improper disposal of logging slash provided the initial breeding material. I. avulsus, the smallest of the Ips, attacks thin barked portions of the trees usually in the upper crown and limbs. Adults are attracted to freshly-cut and injured trees. Any disturbance that causes pitch flow may induce attack.

Attacks are initiated by the male which will mate with two to four females. Egg galleries radiate from the central nuptial chamber giving a characteristic "Y" or "H" shaped appearance. Larval galleries which are more or less transverse develop from the sides of the egg galleries. During warm weather the average life cycle takes approximately 23 days. There is the possibility of eight to ten generations per year on the Refuge.

METHODS

On March 28, 1979 a ground examination of the burned area was conducted. A portion of the saplings were examined to identify the attacking species and determine their development and what threat they pose to the residual damaged stand. Two mature trees were cut down and their crowns and boles were examined for evidence of attack.

RESULTS

The saplings in the old growth stand, blocks 28, 29 and 30 were attacked by Ips avulsus and I. grandicollus. Late instar larvae, pupae, and callow adults were present. Some emergence of the new brood may have already occurred. Examination of downed pines on the plantation revealed fresh attacks by Ips calligraphus. These probably have occurred since salvage began due to the lack of larval galleries. I. grandicollus was also present; with late instar larvae and pupae present.

Examination of the two downed trees showed no evidence of fresh attack on either the bole or crown. The tops of the crowns showed shoot emergence and needle development which indicates a good chance of survival if they are not attacked while in their weakened condition.

RECOMMENDATIONS

The main emphasis should be directed toward the immediate elimination of the developing brood. This will prevent emerging adults from attacking the old growth slash and some longleaf which is a preferred species in dwindling numbers. Currently there are two sources of active brood: (1) the young plantation and (2) the sapling understory of the old growth stand. To accomplish this goal it is recommended that:

1. The remaining trees and slash from the salvaged slash plantation should be piled and burned. For good control all bark should be thoroughly charred. When piling, work from the plantation sides toward the middle. The purpose of this is twofold. First, it will put an added distance between the emerging brood and the old growth stand. Second, the fresh resin produced during the site disturbance will attract the emerging adults from the sapling understory and hold them there for the burning.
2. The sapling understory currently infested should be removed and destroyed. It is essential that control operations be finished before the brood emerges. The following methods are presented for consideration:
 - a. The saplings can be removed and burned along with the rest of the plantation.
 - b. Saplings can be cut and sprayed with 1/2 percent Lindane spray. All bark surfaces should be sprayed to a point of runoff. This chemical is currently registered for this use.
 - c. Saplings can be cut and chipped with a portable chipper and the chips left in the sun to dry. Solar heat and the drying of the cambium layer are both lethal to the developing brood.
 - d. Saplings can be cut to uniform lengths, stacked, covered by a plastic tarp, and dirt piled around the edges. The resulting greenhouse effect will create temperatures high enough to kill the developing brood. Those insects which have completed development and emerge will be trapped. For best results, stacks should be located where they will receive maximum amounts of sunlight. Upon removal of the tarp, logs should be inspected to be sure of total control.

3. Removal of suppressed and stressed trees from the mature stands will aid in the stands recovery. It is best to wait for at least two months before attempting this. This will prevent any emerging Ips that were not controlled from being drawn back into the stands. Good slash disposal is essential.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.